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ABSTRACT

The purpose of a study was to demonstrate the value of multiple evaluation perspectives in the development, implementation, and revision of a series of workshops conducted for inservice teachers. In the Animals in the Classroom Program, the content of the workshop concerned a highly charged issue: the appropriate and humane care and use of animals in the precollege classroom and in student research. To evaluate the program's implementation and impact, qualitative and quantitative information were combined to capitalize on strengths and address the weaknesses of each source of data and converged on a comprehensive picture of the program, rich in details about the participants' knowledge about the use of animals in education. With the assistance of the Advisory Committee, the workshop coordinator modified the content of the workshop to be appropriate for classroom teachers. The resulting workshops were successful from several perspectives: (1) teachers rated them highly; (2) teachers' comments were very favorable; (3) teachers' knowledge and classroom practices changed following their participation in the workshop; and (4) knowledge was gained on teachers' and students' attitudes toward animals. Comments from teachers corroborated quantitative results from the rating scales. Analysis of pre- and post-workshop classroom practices included both quantitative and open-ended questions that documented changes of practical significance in how animals were used in the classroom and in student research. The teachers' questionnaire is appended. (KR)

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MULTIPLE EVALUATION PERSPECTIVES OF THE ANIMALS IN THE CLASSROOM WORKSHOPS

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Multiple Evaluation Perspectives of the Animals in the Classroom Workshops

Nadine K. Hinton, J. Fredrick Cornhill, and Margaret D. Snyder/[1]

Introduction

This paper seeks to demonstrate the value of multiple evaluation perspectives in the development, implementation, and revision of a series of workshops conducted for inservice teachers. In the Animals in the Classroom program, the content of the workshop concerned a highly charged issue: the appropriate and humane care and use of animals in the pre-college classroom and in student research. To evaluate the program's implementation and impact, qualitative and quantitative information were combined to capitalize on strengths and to address the weaknesses of each source of data (Rossman & Wilson, 1985) and converged on a comprehensive picture of the program, rich in details about the participants' knowledge about and use of animals in education.

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[1] The Animals in the Classroom project was conducted by The Ohio State University and The Ohio Academy of Science. Co-directors of the project are J. F. Cornhill, D. Phil., Director of Biomedical Engineering, former Acting Director of University Laboratory Animal Resources, and Professor of Surgery and Pathology, and Margaret D. Snyder, Ph.D., Training Specialist for University Laboratory Animal Resources and Senior Research Associate in Biomedical Engineering at The Ohio State University. Nadine K. Hinton, Ph.D., is a Senior Research Associate in Biomedical Engineering. The project was supported by a grant from the Dwight D. Eisenhower Mathematics and Science Education Program, administered by the Ohio Board of Regents. The content of this article reflects the opinions of the authors, not those of the funding agency.

Program Description

The Animals in the Classroom project was a collaborative project between The Ohio State University's Office of University Laboratory Animal Resources and The Ohio Academy of Science. The workshops were designed in direct response to appropriate and inappropriate criticisms of the use of animals in education and student research and with concern for the quality of life science education. The University's Training Specialist developed and conducted workshops on principles of animal biology, humane care and effective use of live vertebrates, and teachers' responsibilities in using these animals in the classroom.

The program consisted of two parts. First, regional hosts arranged for the 24 workshops to be conducted throughout Ohio, with 504 teachers of grades K-12 participating over a two year period. Part I of the workshop format included lectures, discussions, audiovisuals, and activities on dissection and alternatives to traditional dissection (food items; video tapes; computer programs; laser disks). Two months later, Part II of the workshop was held at which time teachers shared their classroom activities that incorporated the information from Part I. Teachers could elect to receive two hours of graduate credit in zoology by completing additional assignments.

Formative Evaluation: Role of the Advisory Committee

The initial stages of the program development focused on

formative evaluation. First, the Project Staff, bench scientists, and selected outstanding science teachers discussed teachers' needs before preparing the proposal. (It should be noted that evidence of planning sessions involving classroom teachers is required for proposals submitted to the Dwight D. Eisenhower Mathematics and Science Education Program administered by the Ohio Board of Regents.) Discussions with teachers provided insight into the following topics which were ultimately addressed in the workshop's content and schedule:

a. schedule constraints of classroom teachers;
b. pay for the substitute teachers;
c. graduate credit option for participants; and
d. scope and sequence of activities in the K-12 classroom.

These were issues about which the project leaders, as university scientists rather than science educators, were not cognizant at the beginning of the proposal development process.

After the project received funding, an Advisory Committee, whose members included classroom teachers, science educators, biomedical researchers, veterinarians, and representatives from the animal welfare community, was formed. Committee members fulfilled several roles during the two years of initial funding. One role of the Committee was to review the workshop's content and format, with special consideration to the needs of classroom teachers at all grade levels and effective inservice techniques.

Also, the diversity of Committee members' constituencies ensured that the workshop materials were balanced, allowing teachers to experience activities and materials that could be implemented in their classrooms to improve, supplement, or supplant the use of animals in the classroom (Snyder & Hinton, 1991). The philosophy of good stewardship, proposed by Dr. Frederick K. Goodwin, Administrator of the U.S. Alcohol, Drug Abuse, and Mental Health Administration, was also incorporated; that is, society's use of animals is appropriate for purposes such as companionship, food consumption, research, and instruction, when tempered by commitment to judicious, humane, and justifiable activities. (Note: Goodwin also refers to these as the "ABC's": appropriate, beneficial, and caring use of animals.) Finally, committee members reviewed the evaluation materials to determine if the evaluation was of sufficient breadth and also if the results would add to our understanding of teachers' knowledge of and classroom practices involving animals.

Summative Evaluation: Pre-/Post-Workshop Teacher Knowledge and Practices

Since there was little existing research on the issues of interest, a comprehensive evaluation was conducted at the request of the project staff. Summative evaluation of the program examined:

a. teachers' evaluations of the regional workshops

(rating scales and comments);

b. teachers' knowledge of humane care and use of animals (pre- and post-workshop);

c. teachers' use of live vertebrates in the curriculum (pre-workshop and six months post-workshop);

d. implementation of alternatives to the use of live vertebrates and the addition of class/laboratory discussions of humane and ethical concerns;

Teachers' ratings of 11 facets of program content and format were very favorable. Teachers considered the subject matter and handouts to be helpful. The content was presented in an organized manner, and the visuals were clear and useful. The presenter was knowledgeable, spoke clearly and made good use of examples of classroom situations. The second form of feedback was provided by participating teachers' comments about the program. This feedback was useful in tailoring the pacing of the program, particularly the availability of time for discussion. Teachers told us that they learned the quality and quantity of commercially available animal-based science materials for primary grades was limited, as were computer programs for all grade levels. Participants' comments also documented certain strengths of the workshops that were not assessed directly by the rating scale. For example, teachers were very receptive to the opportunity to compare strengths and limitations of computers, videos, and laser discs.

Teachers' pre-program knowledge and practices concerning the

use of animals were insufficient in several areas. At the start of the program, in-service teachers generally lacked specific content knowledge concerning regulations governing the use of animals in education, professional guidelines, and ethical and safety issues concerning animals in the classroom. Post-program tests indicated statistically significant increases in knowledge about these topics.

Teachers also completed brief surveys, pre- and six-months post-workshop, on how they used animals in the classroom, perceived efficacy of dissection, and the extent to which the curriculum addressed animal behavior, nutrition and housing needs, as well as zoonotic diseases and euthanasia when indicated. Their responses indicated that animals are widely used as class pets, for observational studies, and to a lesser extent in collections and student research. Most teachers at all grade levels, including those who did not conduct dissections, believed that dissection was an effective instructional technique. In some cases, teachers' pre-program use of animals or method of procurement was problematic, again reflecting a lack of knowledge of biological principles related to humane animal use and care. Qualitative analysis of the six-month follow-up information indicated significant improvement in these areas and increased knowledge of professional guidelines (Snyder & Hinton, 1991; Cornhill, Snyder, Mayer, Hinton, & Elfner, 1990). For example, three participants in the 1989 program who had indicated that they

would not dissect now included dissections in their lessons. It should be noted that this included one elementary teacher who had indicated on the pre-program questionnaire that she would not permit any use of animals in her classroom; following the workshop, she conducted dissections of food materials. Two teachers eliminated dissections from their lessons (Hinton, 1990). To summarize, the open-ended responses indicated that teachers had reflected at length on their classroom practices and choices of activities.

Responsive Actions Taken by Project Staff

In response to the feedback from the Advisory Committee during the formative stages of program development, the workshop coordinator modified the content of the workshop to be appropriate to the classroom situation instead of to a university laboratory research situation in which she was experienced. The format was revised to present a variety of activities, paced in 45-minute sections alternating lectures, hands-on activities, discussions, and simulations throughout the 1.5 day workshop. This served both to make the presentation more interesting and to model good pedagogy. Committee members also provided valuable information on additional resources and issues that were unaddressed in the prototype workshop's content.

As the workshops were conducted over a two year period, the presentation and activities were fine-tuned in response to

participants' comments. An example concerning the use of plastic plates serves to illustrate how an activity was changed as a result of feedback from teachers. Disposable plastic plates were used instead of dissecting trays which would be unwieldy on the travels to regional workshops and more sturdy than paper plates. Several teachers, however, indicated that they were deeply concerned about solid waste, and the use of plastic plates was offensive to them. As university scientists, staff members were highly sensitive to the ethical and humane care and treatment of animals, but initially less than sensitive to the effect of plastic on the environment--paper plates were purchased immediately!

A final example is that after the completion of the first year's programs, an activity was developed to meet teachers' desires to have more time for discussion. In the activity, small groups of teachers simulated an Animal Care and Use Committee (ACUC) through the examination of hypothetical protocols for animal use in education or student research. Simple lecture materials on the nature of conduct of ACUCs were modified into simulation format, allowing more time for discussion and integration of information from earlier lectures into an applied setting.

Major Findings

With the assistance of the Advisory Committee, the workshop

coordinator modified the content of the workshop to be appropriate for classroom teachers. The resulting workshops were successful from several perspectives: teachers rated them highly; teachers' comments were very favorable; teachers' knowledge and classroom practices changed following their participation in the workshop; knowledge was gained on teachers' and students' attitudes toward animals. Comments from teachers corroborated quantitative results from the ratings scales. Analysis of pre- and post-workshop classroom practices included both quantitative and open-ended questions which documented changes of practical significance in how animals were used in the classroom and in student research.

Conclusion

"...no single image in the kaleidoscope provides all the desired perspectives, so it may be necessary to turn the kaleidoscope slightly now and then in order to increase the number of images and perspectives available to decision makers." (Patton, 1982, p. 157). The Project Staff and Advisory Committee were motivated by more than a contractual understanding with the funding agency to provide a final evaluation of the program's implementation and impact. A simple pre-/post-test or scale to rate the program's delivery could have been used; however, given the enormity of the scientific, educational, and social issues involved in the topic of animal care and use, the Staff and Advisory Committee were concerned not only that the program be

balanced in nature but also that the resulting evaluation be wide-ranging and conducted without interference. In evaluating the Animals in the Classroom project, multiple perspectives on the project's implementation and impact--from science teacher consultants, professionals on the Advisory Committee and from participating teachers--resulted in an evaluation format that yielded rich information about the current use of animals in pre-college classrooms today. Various methods and sources yielded data that was consistent and documented the positive impact of the program. While the project's initial funding has ended, the issue of the humane and ethical care and use of animals in education remains a pressing issue in our society. We hope that documentation of the evaluation of an intervention program on a controversial topic will be helpful to others.

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APPENDIX A

WORKSHOP FOR TEACHERS ON HUMANE CARE AND USE OF VERTEBRATES
BACKGROUND INFORMATION

1. Teacher's Name _____
   College Major(s) _____

2. Workshop Location _____

3. Circle highest degree:
   a. Bachelor's
   b. Master's
   c. PhD

4. Circle grades taught:
   a. Elementary
   b. Middle School/Junior High
   c. High School

5. High school teachers ONLY: Circle course(s) taught:
   a. Biology
   b. General Science
   c. AP Biology
   d. Honors Biology
   e. Advanced Biology
   f. Other (describe) _____

6. Elementary and middle school teachers ONLY:
   How many minutes per week do you spend on science? _____

7. Please indicate the ways in which <u>live</u> animals are used in your classroom.
   a. visits to zoos, etc.
   b. conservation unit
   c. animal visits classroom
      species _____ source _____ duration of visit _____
      species _____ source _____ duration of visit _____
   d. ecology unit
   e. class pets
      species _____ source _____ duration of visit _____
   f. other (describe) _____

8. Do you have an Animal Care and Use Committee in your school/district?
   a. yes
   b. no
   c. don't know

9. Do you discuss with students how the animals are obtained?
   a. yes
   b. no

10. Are you familiar with the National Science Teachers Association guidelines for humane care of animals?
    a. yes
    b. no

11. Do you discuss the National Science Teachers Association guidelines for humane care?
    a. yes
    b. no

12. Are you familiar with The Ohio Academy of Science's guidelines for the use of animals in research?
    a. yes
    b. no

13. Do you discuss The Ohio Academy of Science's guidelines for the use of animals in research?
    a. yes
    b. no

14. Briefly describe how you include the following topics in your science class(es).

    zoonotic diseases

    behavioral needs of animals

    housing needs of animals

    euthanasia of animals

    nutritional needs of animals

15. Please briefly describe any prior incidents in which students have expressed concern over the use of animals in the classroom (either in dissections, student research, or live animals as exhibits).

16. Do you/your students conduct dissections?
    a. yes - answer questions 17-20
    b. no - answer questions 21-22

17. Number of dissections per year: _____

18. Where do you obtain the specimens? (circle all that apply)
    a. biological supply
    b. grocery or bait store
    c. other (describe_____)

19. How effective do you perceive the use of dissection at your grade level?
    a. effective
    b. not effective
    c. other (describe)

20. What are the educational objectives of dissection at the grade level which you teach?

21. Why do you not dissect animals?

22. What activities do you use in place of dissection?

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